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OBSERVATIONS ON WILLOW BLIGHT IN MAINE, 1927 TO 1938

F. H. Steinmetz and A. E. Prince

According to Clinton[1/] the scab fungus of willows was first observed causing disease in North America in 1927. During August of the same year the blighted condition of willow trees was observed in Hancock County, Maine, by the senior writer. Its spread throughout the State has been rapid. In 1931 blighted willow trees were observed throughout most parts of the State. At Fort Kent, the blight appeared to be in an early stage. In western Maine, at Fryeburg, willow trees showed no blighted twigs. Along the coast willow trees were blighted from Kittery to Calais. The most striking destruction of the willows occurred from Ellsworth eastward to Calais.

During the somewhat warm and dry seasons of 1934 and 1935 willow blight appeared to be on the wane. In 1936, 1937, and 1938 the blight has been strikingly evident. In 1937 certain trees (at Orono) under observation were practically defoliated by July 1, but during late summer there was a fair development of new shoots. This year the same trees are practically defoliated at present (July 20). A study of field observations and weather records indicates that cool, wet weather favors the disease while warm to hot, dry weather suppresses its development.

On a recent trip to Ottawa, Canada, via Bangor, Lewiston, and U. S. No. 2 from Bethel, Maine, to Burlington, Vermont, and on through northern New York to Ottawa, it was observed that willow blight became less evident after leaving Lewiston, Maine. The last roadside cases were noted in western Vermont. Along the St. Lawrence and Ottawa Rivers no willow blight was observed.

Spores of Fusicladium saliciperdum were abundant on specimens collected in Maine during June. Sporulation is variable. It has been found that spores develop on leaves blighted in the early spring and during cool wet weather. In 1937 laboratory cultures from winter twigs with lesions developed Fusicladium spores in vitro. It was also found that spores did not form in vitro at higher temperatures (75 to 80° F.).

Laboratory isolations yielded other fungi, such as Fusarium and Physalospora. However, early summer field observations indicate that Fusicladium saliciperdum is responsible for the blighted leaves and young shoots.

1/ Conn. Agr. Exp. Sta. Bull. 302.

Since 1928 it has been observed that several large trees in the heavily infested area between Hancock Station and Sullivan were free of blighted twigs. Since then numerous similar trees at several points in Maine have been observed to be blight-free. Relatively large stands of this resistant type occur along the Kennebec River at Waterville and Augusta. In the Ellsworth-Calais area the susceptible large willow trees have been killed and removed. This susceptible type is considered to be Salix alba var. vitellina. The resistant type, also a large tree, has been identified as Salix fragilis. On the other hand, susceptible types collected in Maine have also been identified as S. fragilis. Trees of the resistant type fit the general description of S. fragilis and insofar as it has been observed they are staminate and may well belong to a single clone. Based upon field observations this tree type and S. pentandra have survived in a vigorous condition in areas where susceptible types have been killed.

(University of Maine).

NOTES ON SOME TREE DISEASES IN GEORGIA

G. E. Thompson

The observations reported in the following notes were made chiefly in the vicinity of Athens, Clarke County, Georgia.

Considerable infection with pine gall rust caused by Cronartium quercuum (Berk.) Miyabe was observed in some five-year old plantations of Pinus caribaea Morelet and P. taeda L. The galls were of the fusiform type. The majority of the swellings were located on the lower branches, probably an indication that the infections originated in the nursery. The development of numerous rapidly growing branches was very frequently associated with the swellings. Dead branches were observed on several trees. Some infections located low on the main stem caused the production of several leaders giving the tree a bushy appearance. A few trees were apparently killed by the disease. A few globose galls were noted on naturally reproduced P. echinata Mill. On P. virginiana Mill. in North Georgia only the globose type of gall was observed. Branches and main stems showed infections.

Collections of the alternate stages were made on several species of oaks. Uredinia and telia were found on Quercus alba L., Q. stellata Wang., and Q. montana Willd. The following species showed only the telial stage: Q. borealis Michx., Q. marilandica Muench., Q. nigra L., Q. palustris Muench., Q. pumila Walt. (near Tifton), Q. rubra L., and Q. velutina Lam.

Atropellis canker was observed on the following pines: Pinus caribaea, P. echinata, P. taeda, and P. virginiana (Northern Georgia). It appeared to be causing considerable damage in a plantation of P. caribaea. On some trees as many as two-thirds of the branches were affected and dying. Most of the infections were on branches less than 1.5 in diameter.

Hypoderma lethale Dearness was found associated with a leaf cast of Pinus echinata, especially on trees in the open.

Oak leaf blister [Taphrina coerulescens] was very common and in some cases caused rather severe defoliation, especially on the lower branches. Collections were made on the following species: Quercus alba, Q. borealis, Q. coccinea, Q. marilandica, Q. montana, Q. nigra, Q. palustris, Q. rubra, Q. stellata, and Q. velutina. The susceptibility of the various species varied considerably as well as the susceptibility of individuals within a species. Quercus alba, Q. montana, and Q. stellata showed the least amount of infection. The symptoms on Q. marilandica and and Q. rubra appeared as yellowish-brown somewhat velvety lesions with little or no tendency to 'blister' or 'curl'.

Common leaf spot diseases observed are given in the following list:

Cercospora cercidicola Ell. on Cercis canadensis L.
Cercospora liriodendri Ell. & Hark. on Liriodendron tulipifera L.
Fabraea maculata (Lév.) Atk. on Amelanchier canadensis L.
Gnomonia leptostyla (Fr.) Ces. & DeNot. on Juglans nigra L.
Guignardia aesculi (Pk.) Stewart on Aesculus georgiana Sarg.
Microstroma juglandis (Bereng.) Sacc. on Hicoria alba (L.) Britton, H. glabra (Mill.) Britton, and Juglans cinerea L.
Phyllosticta minima (Berk. & Curt.) Ell. & Ev. on Acer rubrum L. and A. saccharinum L.
Septoria acicola (Thüm.) Sacc. on Pinus palustris Mill.
Septoria cornicola Desm. on Cornus florida L.
Septoria gigaspora Ell. & Ev. on Celtis pumila var. georgiana Sarg.
Septoria musiva Pk. on Populus deltoides Marsh. and P. nigra var. italica DuRoi.

(University of Georgia).

POSSIBLE DAMAGE CAUSED BY STEM RUST OF WHEAT IN 1938

Present indications as to the possible amount of damage that already has been and may still be caused by stem rust to the spring and winter wheat crops in various regions are summarized on the accompanying map (Fig. 1, page 286), which is compiled from various sources, mostly summaries of the Bureau of Entomology and Plant Quarantine, and also reports in the Cereal Courier.

These estimates and forecasts are, needless to say, only tentative. Up to the date of the last report (July 20) there was still much uncertainty concerning the amount of damage, especially in the spring wheat area.

Recent press releases of the United States Department of Agriculture are as follows:

(July 16) "Hot weather during the past few days is maturing wheat rapidly and retarding the development of rust in the Dakotas and Minnesota, according to a survey on July 14 by representatives of the Bureau of Entomology and Plant Quarantine.

"The aggregate amount of damage from stem rust in Minnesota will be slight as winter wheat, for the most part, has escaped damage and approximately 85 percent of the spring wheat is Thatcher, which is proving resistant to prevalent forms of the fungus.

"In southwestern South Dakota and in the Bismarck-Minot-Park River area of North Dakota there is considerable rust developing on Marquis and Ceres with the crops still ten days from harvest. Wheat is ripe from Mobridge to Aberdeen, South Dakota, and as far north as Jamestown, North Dakota, with rust prevalent on susceptible varieties but only occasional fields are expected to be damaged to any extent.

"Harvest is well under way in Nebraska and, except for certain limited areas, the damage caused by stem rust in the eastern part of the State will be slight. Rust has caused some shrivelling in late fields in certain areas in western Nebraska and southwestern South Dakota.

"There still is comparatively little rust on durums. In general, stem rust of oats is not heavy and barley for the most part is escaping damage. Rye is relatively free from stem rust except in the immediate vicinity of barberry bushes."

(July 23) "Stem rust of wheat has developed rapidly during the past week on Ceres and Marquis wheats in North Dakota and northeastern Montana, the Bureau of Entomology and Plant Quarantine reports. Heavy

Fig. 1. Probable damage from stem rust of wheat in 1938, as indicated by reports from various sources (up to July 20). (See page 285).

initial infection apparently took place in this area during late June and early July and rust is now epidemic on these varieties but as yet the extent of the damage cannot be determined. Rust still is relatively light on most durums.

"A conspicuous feature of rust development this year is that the epidemic extended northward and westward from the hard red winter wheat area but not northeastward as in 1937. The total damage for South Dakota will not be great and losses from stem rust in Minnesota will be relatively slight, but there will be serious loss in many fields of Marquis and Ceres in North Dakota and eastern Montana. Thatcher, which is planted extensively in Minnesota and the eastern Dakotas, is maturing relatively free from stem rust.

"Rye, oats, and barley will not be damaged severely by stem rust this year.

"Leaf rust of wheat and crown rust of oats are generally prevalent and will cause some loss. Scab has developed heavily on wheat, including Thatcher, in the southern and eastern portions of the hard red spring wheat area and will cause up to 15 percent loss in some fields. Injury from scab is being confused with rust damage in some cases."

ERGOT ON BARLEY IN ILLINOIS

G. H. Boewe

Ergot (Claviceps purpurea (Fr.) Tul.) has been found this year in one barley field of about five acres located south of Dixon in Lee County. This disease seldom occurs on this host in Illinois, but it was more prevalent in this one field than is reported in any previous record in this State. Of 500 heads examined in 5 different locations in the field, 0.8 percent were infected. The disease was fairly evenly distributed over the field, being observed in 8 of 10 places examined.

Ergot has been recorded on barley in Illinois in three previous years, 1924, 1927, and 1932. In 1924, it was found in six fields but, as in 1927 and 1932 when only single infected fields were found, prevalence was only a trace. The individual records of barley infection for Illinois follow.

Fig. 1. Probable damage from stem rust [illegible] sources (up to July 20). (See page 285).

1924	Boone County	20 acres*	6 infected heads found
	Kane County	10 acres	2 infected heads found
	Kane County	15 acres	1 infected head found
	Carroll County	20 acres	4 infected heads found
	Lake County	10 acres	1 infected head found
1927	Ford County	14 acres	1 infected head found
1932	Edwards County	3 acres	1 infected head found
1938	Lee County	5 acres	0.8 percent in 500 heads counted.

* Barley and oats.

(Section of Applied Botany and Plant Pathology, Illinois State Natural History Survey).

OAT ANTHRACNOSE IN ARKANSAS IN 1938

H. R. Rosen

What appears to be anthracnose, caused by Colletotrichum graminicolum (Ces.) Wils., was widespread on oats in Arkansas this season. At the Agricultural Experiment Station Farm, Fayetteville, it was especially abundant and was noted on many varieties. It was also noted in various other localities in a number of counties. The fungus was found not only on vegetative parts but on glumes and on kernels. Its presence on the latter was commonly associated with light, shriveled grains. As a whole, the symptoms as well as microscopic appearance of the fungus agree with the original account of Selby and Manns (Ohio Agr. Exp. Sta. Bul. 203).

It is almost impossible to estimate the amount of damage caused by this fungus since crown rust, injuries induced by excessive rains (in the form of malnutrition) and various other agents, mostly microorganisms, were involved. It may be said, however, that anthracnose was so common that at least part of the light weight of the grain -- a marked character of oats this season -- is due to this disease.

There is a possibility that certain hybrids, of recent origin, are resistant or escape anthracnose infections, since the disease was not found on these even though they grew close to others which were abundantly infected. This remains to be ascertained.

(Agricultural Experiment Station, University of Arkansas).

FIREBLIGHT ON APPLE IN NORTH CAROLINA

H. R. Niswonger

Fireblight [Bacillus amylovorus] infection ranged from light in orchards located in the Blue Ridge Mountains to severe in the Piedmont and Eastern Carolina areas. In the Blue Ridge area most of the standard commercial varieties such as Delicious, Stayman, Rome, and Golden Delicious, were not infected except in a few orchards where a very light infection appeared on Golden Delicious and Stayman. Varieties like Hoover had severe infection, Red June light, and Early Harvest medium.

In many orchards in the Brushy Mountains area, a chain of mountains rising out of the Piedmont Plateau near the Blue Ridge, infection is severe on Limbertwig, Bonum, and Red June, and moderate to severe on Golden Delicious.

On Stayman, Red Delicious, and Winesap adjacent to other severely attacked varieties infection ranges from light to moderate, while away from susceptible varieties it is very light.

It was observed that in a few orchards where the 1-3-50 Bordeaux bloom spray was omitted in order to cut operating costs, Limbertwig, a very susceptible variety, was badly damaged by blight. In previous years during an outbreak of blight these orchards under a bloom spray program were only slightly infected.

(Extension Horticulturist, University of North Carolina).

"BLUE MOLD OF TOBACCO IN CANADA"

L. W. Koch

(Quoted from "The Lighter", issued by the Tobacco Service of the Department of Agriculture, Canada. Volume VIII, no. 3. July 30, 1938. pp. 8-9).

"Though blue mold (Peronospora tabacina Adam) was collected in 1906 on cultivated tobacco seedlings on this continent in Texas, it was not until 1931 that it appeared in Florida, Georgia, and Louisiana. Since that time it has moved gradually northward, appearing as far north as Connecticut in 1937. June 7, 1938, marked the discovery of the first blue mold on tobacco in Canada near the town of Essex, Essex County, where it severely damaged 1,200 square feet of seedlings of the variety Judy's Pride. Inspection of a neighbour's seedbeds proved them to be affected also. Here the variety was Halley's Special. Five days later it was

observed in a seedbed (Judy's Pride) five miles west of the first outbreak and since that time the disease has been identified by H. F. Murwin, Superintendent of the Harrow Station, in three more seedbeds, one about four miles west of the original outbreak, one at Kingsville, about 12 miles southwest, and another at Blenheim, 60 miles due southeast of the first outbreak.

"Eradication of all possibly affected plants was practised. In the case of the grower on whose place the first outbreak was discovered, seven acres had already been planted before the disease was identified. One week later this grower ploughed up four of the seven acres of plants, because many were still dying in the field. On June 24 a case of damage by blue mold to flue-cured tobacco (Gold Dollar) in the field, was brought to our attention. Here about six per cent of about four acres of plants were affected in varying degrees. Damage varied from several necrotic areas on single leaves to complete death of affected plants. Both leaves and stems showed necrotic areas on severely affected plants, and the fungus was fruiting abundantly at that time on diseased tissues even though the mean temperature on June 24 was 79° F.

"An analysis of the meteorological data at the Harrow Station, about 15 miles from the original outbreak of the disease, has shown that for the three days May 27, 28, and 29, the mean temperature was 61.1° F., and the average relative humidity was 82 per cent, thus constituting particularly favourable conditions for blue mold infection. Prior to the later outbreak of blue mold in the field, there was a period from June 9 to 12 inclusive, when the mean temperature was 56° F. and average relative humidity was 86 per cent. During this period rain fell on each of the three days June 9, 10, and 11.

"As for the introduction of blue mold into Canada in 1938, it seems likely that the sporangia were air-borne across Lake Erie. On the other hand, it is difficult to speculate regarding the future of the disease in this country. Judging, however, from the experience of our neighbours to the south with blue mold, and keeping in mind the fact that Peronospora tabacina is a fungus, the optimum temperature range of which is low (45° to 60° F.), and also that the average temperatures of our tobacco growing districts are somewhat lower than many of those to the south of us where this disease has caused extensive damage, it is not unnatural to be somewhat apprehensive. However, one factor in favour of the possibility of good control in the new and concentrated tobacco growing district of Norfolk and adjoining counties is the tightly constructed glasshouses in which the seedlings are grown in this district."

(Assistant Plant Pathologist, Dominion Laboratory of Plant Pathology, St. Catharines, Ontario).

"PROGRESS OF THE CANADIAN TOBACCO CROP"

(Excerpts from The Lighter, Volume VIII, no. 3, pp. 5-8).

"Ontario"

"Old Belt

"The early growth period, which covers the transplanting season and field growth up to July 15, has been exceptionally favourable, on the whole, for the tobacco crop in the Old Belt. The average minimum temperature was only slightly lower than normal. Precipitation has been higher than normal and fairly evenly distributed throughout the period in all parts of the district.....

"Of the various diseases affecting the tobacco crop, root-rots, both brown and black [Thielaviopsis basicola], were quite general, with possibly a greater acreage than normal being severely affected with brown root-rot. A few cases of leaf spots were noted. Blue mold was recorded for the first time in Southwestern Ontario. Although it is early yet to estimate the loss from mosaic, the degree of infection at present appears to be below normal".....

(R. J. Haslam, Tobacco Specialist, Experimental Station, Harrow).

"New Belt

"Weather conditions have been unusual in some respects, although rainfall has been practically normal this season. Seedlings developed rapidly in the seedbed, with the result that in many cases it was considered necessary to transplant much earlier than usual. Roughly 10 per cent of the tobacco in the New Belt was transplanted previous to a killing frost on the night of May 24. Although the plants survived on much of the area, considerable replanting was necessary in most cases. It is expected that yields will be light on some of the very early plantings since they have developed a smaller number of leaves than normal. A sandstorm on June 6 completely destroyed an estimated area of 5,000 acres and damaged an additional 5,000 acres. Rain followed the sandstorm, with the result that conditions were almost ideal for replanting. There was, however, some delay in obtaining sufficient seedlings with the result that the transplanting season was extended beyond the middle of June.

"Soil moisture was abundant but not excessive during the transplanting season. Rainfall was scanty in some sections, however, between the middle of June and July 9. The tobacco developed an excellent root system during this period but some crops, particularly those planted early, suffered from drought.

"A good rain came on July 9 and 10 over practically the whole district. Hail which fell at the same time damaged an estimated acreage of 1,500 acres of tobacco. The damage ranged from seventy per cent down. On the afternoon of July 13 further rain fell, accompanied by light hail damage in a few sections.....

"Diseases are present in about the usual proportions. Mosaic is present as usual where tobacco follows a crop of tobacco on the same field. Leaf spots are reported as less prevalent than in other years. Frenching is in evidence, although not so prevalent as during 1937. Both black root-rot and brown root-rot are present....."

(F. A. Stinson, Experimental Farm Assistant (In Charge), Experimental Substation, Delhi).

"Quebec"

"Northern District

"The cold weather of the last two weeks practically stopped the growth of tobacco, but nevertheless the crop is about six days earlier than last year. With warm weather a large crop will be produced. The relatively cold weather of the last week of June and the first week of July will probably favour the development of black root-rot. Some fields are already showing the characteristic appearance of tobacco affected with the disease. The damage by black root-rot will probably be heavier than in 1937, but not so serious as in previous years....."

(J. E. Montreuil, Superintendent. Experimental Station, L'Assomption).

"Southern District

"The precipitation during June was slightly lower than last year at the Station, while in some parts of the district it was much lower.....

".....The mosaic disease is of minor importance, but the cool weather has been conducive to black root-rot.

"The crop in general looks promising, and is to date in advance of last year."

(R. Bordeleau, Superintendent. Experimental Station, Farnham).

"British Columbia"

".....The season has been warm and dry. Generally the crop is well established, being early, clean, fairly uniform, and almost free of insect pests and diseases. Rain would be beneficial to the crop on the

lighter soil areas..... Some rust and mosaic are appearing in a few fields but not to any large extent. On the whole, the crop appears to be away to a good start."

(A. J. Mann, Tobacco Specialist for British Columbia. Experimental Station, Summerland).

CONTROL OF TOBACCO DOWNY MILDEW IN GEORGIA, 1938

S. B. Fenne

The results of red copper oxide spraying for the control of blue mold [downy mildew] in tobacco beds have been summarized for 137 demonstrations in 19 counties. These results indicate a very satisfactory control of downy mildew. In most cases farmers had sufficient plants to set their allotted acreage even though they did not spray; however, individual growers in certain counties had 100 percent loss of beds; others suffered severe losses. The estimated loss of plants for the State is 20 percent.

In practically all cases where the grower began spraying his plants before the disease appeared and continued to spray twice weekly, according to instructions, he obtained very satisfactory results. Almost all growers intend to spray their beds again next year as an insurance proposition.

During the past season extremely dry weather set in and prevented a serious outbreak; however, the disease was present in every bed inspected. In most cases it appeared in unsprayed beds about one week earlier than in sprayed; also plants from sprayed beds were ready to set about one week sooner.

The disease frequently appeared in the sprayed beds suddenly and apparently was going to cause severe damage; but in all cases reported was of short duration. The plants recovered in about three days and were ready to set in the field. However, if the unsprayed plants became infected at about setting time they were usually delayed two or three weeks before they recovered sufficiently to be set.

The most important criticisms of our spraying operations during 1938 were: (1) Many farmers neglected to start spraying until the mold appeared in their own beds. (2) Insufficient amounts of spray were applied when the plants grew larger. Usually the same amount was applied to large plants late in the season as to small young plants resulting in a poor coverage. (3) Some growers failed to continue the spray program after they observed the disease in their sprayed beds.

Many growers still want complete control; when the disease appears they feel as if they are not getting proper results.

It is estimated that about 50 percent of all of the tobacco growers in the State sprayed their plant beds.

(Extension Plant Pathologist).

DOWNY MILDEW CONTROL IN NEW ENGLAND

P. J. Anderson reports "Control of downy mildew achieved in New England" by the use of either benzol or paradichlorbenzene, in "Tobacco", vol. 106, no. 26, pp. 12-14. June 30, 1938.

A CONDITION RESEMBLING RUFFLE LEAF OF TOBACCO REPORTED IN GEORGIA

S. B. Fenne

A tobacco plant with symptoms somewhat similar to those described for the new disease, ruffle leaf, reported last year by Dr. S. G. Lehman in North Carolina[1/] [2/], was brought recently to the Coastal Plain Experiment Station for diagnosis. Mr. James Carr, Agronomist of the Experiment Station, stated that he had observed several similar tobacco plants during the past season.

While the plant in question shows many of the characters described for ruffles, it differs in the following respects: the enations are on the upper surface of the leaf while Dr. Lehman reports them on the lower side only; the leaf-margins on the Georgia plant do not have the typical short narrow tight downward roll that binds the leaf; in typical ruffles the affected leaves are reported to be thicker and darker green than normal, while the Georgia specimen appears to be quite normal in this respect.

(Extension Plant Pathologist).

1/ Lehman, S. G. Ruffle-leaf: a new disease of tobacco in North Carolina. Plant Disease Reporter 21: 296-297. 1937.

2/ Ibid. Ruffle leaf of tobacco. (Abst.) Phytopath. 28: 14. 1938.

TOBACCO DISEASES IN GEORGIA IN 1938

S. B. Fenne

Evidence such as numerous reports from county agents, specimens sent in, and a short survey of several tobacco counties, indicates that root knot (Heterodera marioni) is a very serious problem in Georgia. In some counties almost every field inspected showed some injury from nematodes. In certain fields as much as an acre of tobacco was completely ruined, and in some cases the crop was not even harvested. Rather definite results were observed where the grower had followed a three-year rotation of nematode resistant crops preceeding tobacco. Root knot is undoubtedly the most serious disease of tobacco in Georgia. It appears regularly year after year.

Granville wilt (Bacterium solanacearum) has not been observed this year. In 1937 this disease was reported in about sixteen counties in the State.

Fusarium wilt (Fusarium oxysporum var. nicotianae) has not been observed in the field.

Only one case of typical mosaic and two cases of ring-spot (both virus) were observed in flue-cured tobacco. In shade tobacco there was considerably more mosaic. One corner of a two-acre field of shade tobacco showed about 10 percent.

Sore shin caused primarily by Sclerotium rolfsii and occasionally by Rhizoctonia solani has been reported in only a few fields.

A trace of black shank, Phytophthora parasitica var. nicotianae, was observed in a few fields inspected. It is reported by Mr. J. G. Gaines that black shank is rather a serious disease in the shade tobacco area of Georgia.

The occurrence of a condition resembling ruffles is reported above (p. 294).

(Extension Plant Pathologist).

THE WEATHER AND DISEASE SITUATION IN MASSACHUSETTS THIS YEAR

O. C. Boyd

The 1938 season promises to be another outstanding one for many plant diseases. It could be considerably milder than last year's record season and still be an unusually troublesome one for the commercial growers and home gardeners. In both 1937 and 1938, April was about normal for rainfall, but this year the month was 3.4° F. above normal for mean temperature. The highest maximum daily temperature was 88° on the 28th. The warm weather of April, following an unusually mild March (+ 3.2° F. mean temperature), accounted for the generally early spring with vegetation starting from 10 to 12 days ahead of normal and maintaining that pace until the prolonged cold period of the first half of May was encountered.

Although May this year was close to normal in rainfall, it was 1.2° F. below normal in mean temperature, and there were four general infection periods (May 7, 14-15, 20-21, 26-27). These rains, together with the prolonged wet periods of April 18-19 and 29-30, insured a vigorous start of certain diseases particularly among early starting flowers, shade trees, and fruits.

The spacing of those rain periods during April and May was such as to allow fruit growers ample opportunity to protect apple orchards without much difficulty before the blossom period which began in most orchards around the first of May. With a long, cold blossom period, however, (May 1 to 21, including the later blooming varieties), there occurred a splendid opportunity for heavy primary scab infection on May 14-15 for growers who did not apply a special scab spray shortly before the rain of that date, and who failed to get the regular calyx spray on before or just after the rain of May 20.

Although there were only four general rains in June (June 2-3, 7-8, 11-13, 26-29), the precipitation was extremely heavy during the last two, running the total to 8.45 inches, more than double the normal precipitation for the month. This record compares with six rainy periods and 5.72 inches for June of 1937. Apple growers who failed to prevent scab infections during the latter half of the long blossom period and (or) during the remainder of the period for primary infection (to around June 5-10), encountered no end of difficulty throughout June and to the present time in controlling scab on both foliage and fruit.

July as a rule is a rather warm, dry month and not very favorable for the rapid advancement of most crop diseases. This year, however, there have been two long wet periods to date, on July 11-14 and 18-22, which greatly favored the spread of fruit, potato, and some vegetable

diseases that ordinarily remain quiescent during this month. The nights, however, have averaged much warmer than those for June, which condition of course has not greatly favored certain downy mildew diseases. Nevertheless, the character of the weather to date points to the extreme importance of crop protection to prevent late season disease losses.

Prominent Diseases: The following diseases have been notably conspicuous and damaging this year: Botrytis blights of tulip and peony [B. tulipae and B. paeoniae]; bacterial black spot of larkspur [Bacterium delphinii]; powdery mildew and black spot of roses [Sphaerotheca pannosa and Diplocarpon rosae]; anthracnose of oak and sycamore [Gnomonia veneta], and Gnomonia leaf spot of elm [G. ulmea].

Apple scab and frog-eye leaf spot [Venturia inaequalis, Physalospora obtusa]; brown rot [Sclerotinia fructicola] of plums and cherries; plum pockets or bladders [Taphrina sp.] (eastern shore areas); and downy mildew [Plasmopara viticola] of grapes during and shortly after bloom.

Tobacco downy mildew, bacterial angular leaf spot [Bacterium angulatum], and damping off in the beds, and stem-girdle or "sore-shin" in the field (probably Rhizoctonia).

Internal browning of seed-potatoes (but leaf roll in the corresponding fields not proportionately high); excessive Fusarium dry rot in some lots of certified tubers; and late blight [Phytophthora infestans] in the field. On July 6, county agent Chas. W. Harris, Jr. of Bristol County found late blight in the Dartmouth-Westport area to be common but under commercial control in fields that had been sprayed three to four times, while unsprayed fields he reported were entirely dead. He stated that "cool, damp nights with no spraying did it".

Like 1937, this year was an early season for the development of late blight. The disease has been troublesome on Long Island since the second week of June. Apparently it started around the middle of the month in Bristol County in order to be in the destructive stage reported by C. W. Harris on July 6. The unusually cool, damp weather during June, particularly in the extreme eastern and southeastern sections of the State, was ideal for the development of late blight. However, losses were not appreciable where spraying was adequate prior to July.

Bean anthracnose [Colletotrichum lindemuthianum], celery early blight [Cercospora apii], and cucumber bacterial wilt [Bacillus tracheiphilus]. Only one definite report of bacterial wilt [Aplanobacter stewarti] of sweet corn has been received. County agent Chas. W. Harris of Bristol County submitted specimens and reported (July 19) that "We have a great many fields that show bad infection this year, especially Golden Early Market, both purchased and home grown seed." The specimens represented typical primary infections.

Onion downy mildew [Peronospora destructor] was not observed this year until recently when W. G. Colby of the agronomy department reported 2 or 3 scattered new infections in set onions in Hampshire and Franklin Counties. Blast is not serious this year, but there is ample time for its development in the seed onion crop following the present rainy period. The set onion crop is now being harvested.

Spray Injury: The usual amount of injury resulted on apple foliage from early season applications of lime-sulfur plus lead arsenate. More than the usual amount of fruit russet on Delicious is being reported generally, resulting apparently from the calyx or first-cover spray. The hot period of June 18-25, coming shortly after the regular second cover spray, and at the same time some growers were applying a special scab spray, was responsible for considerable sulfur scald on foliage and fruit in many orchards. The usual arsenical injury to peach trees has been experienced where the zinc-lime corrective was omitted.

(Massachusetts State College).

PLANT DISEASES REPORTED FROM NEW YORK

Potato Diseases. Late blight [Phytophthora infestans] is evidently very prevalent on Long Island. H.S.Cunningham, at Riverhead, reports "Weather conditions have been such that late blight has caused severe defoliation in unsprayed potato fields." According to J. O. Nottingham (reports from the Weekly News Letter), in Nassau County late blight began showing on a few farms about the middle of June. "Fortunately, the recent rains have not been accompanied by temperatures favorable to the continued spread of late blight; I say fortunately because the fields have been so wet that the growers have been unable to keep the new growth covered with copper. Rot in potato tubers varies from 2 percent by actual count in a field of cobblers to a report of 30 percent which has not been verified. Rot is least apparent in fields where the vines were rapidly dying at the time of the big outbreak during the first week of July. This in spite of the fact that many such potatoes were heavily blighted. Tuber rot has progressed to such an extent that most affected tubers are now being left in the field and very few are being discarded during the bagging and grading operation. This in a way is an improvement in the situation since only a week to ten days ago, most of the affected tubers were being discarded at the grader." (July 25). He remarks that "Blight in Nassau County has occurred so seldom in the past that many growers are having their first encounter with it."

Regarding late blight in up-state New York, M. F. Barrus reports "Late blight has been observed in at least two of the southern counties of this State and is very severe in Pennsylvania. If present weather conditions continue there is grave danger that the disease will become epidemic in up-state New York." (August 1).

H. S. Cunningham reports that early blight [Alternaria solani] has been the cause of much defoliation on the North fork of Suffolk County, but although it is present on the South fork, little defoliation has resulted.

Considerable rhizoctonia injury [R. solani] can be found in many fields in Monroe County. (R. G. Palmer, July 25).

Blackleg [Bacillus phytophthorus] has been rather severe in some fields in Nassau County. There evidently has been a late season development which did not start to show up until the potatoes were fully developed. (J. O. Nottingham, July 18).

Z-disease [undet.] is easily found in many fields in Monroe County, and it appears to be more abundant than last year, especially in sections where it has not previously been common. (R. G. Palmer, July 25).

Vegetable Disease Notes. Since the recent rains, muskmelons are beginning to show symptoms of three leaf blights: anthracnose, macrosporium (Alternaria) leaf blight, and septoria leaf spot [Colletotrichum lagenarium, Alternaria cucumerina, Septoria cucurbitaccarum]. Almost an epidemic of cabbage and cauliflower blackrot [Bacterium campestre] is beginning to show in the State. A diagnosis, therefore, should be made from each diseased field, for the disease can so easily be confused with cabbage yellows. (Charles Chupp, July 25).

Vegetable Diseases on Long Island. Downy mildew [Phytophthora phaseoli] has appeared in localized areas in Lima beam fields but has not as yet become general. Occasional plants in Lima bean fields show wilting and on examination are found to be infected at the lower node, where the tissue has collapsed. The cause has not yet been definitely determined.

Bacterial wilt [Bacillus tracheiphilus] is common in fields of cucurbits.

Early plantings of cauliflower, which ordinarily are ready for the market during July, are almost a complete loss due to Bacillus carotovorus soft rot. (H. S. Cunningham).

From Nassau County Orson S. Cannon reports: It has rained every day since July 15 in Nassau County, and it is still raining. Total rainfall for the week has probably exceeded six inches. Carrot leaf spot and blight, caused by Cercospora apii var. carotae and Macrosporium carotae, have been found in all carrot fields observed recently. Carrot tops are becoming very unsightly because of these diseases. Damping off is causing losses as high as 90 percent in spinach, and in some cases plants

from red copper oxide treated seed have damped off as severely as plants from untreated seed. Spinach nearly ready to harvest is rotting where the leaves are in contact with the soil. The organism causing the rot appears to be Sclerotinia sclerotiorum. (July 25).

Celery Blights and Onion Mildew. Early blight of celery (Cercospora apii) has been found on small plants on Staten Island, Orange, Tompkins, Cayuga, and Wayne counties. The weather has been exceedingly favorable for its development over the State and growers who are not alert to the situation may wake up too late to obtain a clean crop. Late blight [Septoria spp.] has also been observed in advanced state of development in a field where it was severe last year. Celery seed treatment tests have again shown the value of using two and three year old seed rather than rely on seed treatment for blight control. The race continues between the onion mildew fungus Peronospora destructor and the late crop of seeded onions with the weather of the past week favoring the fungus very much all over the State. Harvest of early sets is well under way in Orange County with yields very satisfactory, but the seeded crop has been going down fast with excessive rains, mildew and blast or tip burn. (A. G. Newhall, July 25).

Cereal Diseases. In Orleans County considerable loose smut [Ustilago tritici] is visible on wheat. Harvest is now in full swing. (A. G. West, July 18.

In Nassau County sweet corn is now being harvested. Bacterial wilt [Aplanobacter stewarti] is not very serious because hybrid corn varieties have generally been planted. (Orson S. Cannon, July 18).

SCLEROTINIA SCLEROTIORUM ON ORNAMENTALS IN MISSOURI

John T. Middleton

A disease of Centaurea cyanus, Delphinium ajacis, Schizanthus pinnatus, and Calendula officinalis, caused by Sclerotinia sclerotiorum has been observed by me in some greenhouses at Columbia, Missouri.

On Calendula officinalis the fungus caused a crown rot, not affecting the upper portions of the plant. On the other hosts, all parts of the plant were affected, particularly the crown and basal portion of the stem.

In Centaurea the disease was most noticeable in that it caused a blighting of the tips of the plant, killing the terminal buds, both vegetative and reproductive. This was possible in that the stem cavity permits the rapid growth of the fungus, whereas its rate of growth in the

cortex and vascular system is considerably slower. No necrosis of the stem was visible, yet the apical portion of the plant was severely affected. It was a very striking symptom.

(University of California, College of Agriculture).

BRIEF NOTES ON PLANT DISEASES

DISEASES ON WHEAT IN VIRGINIA: The wet weather at seeding time caused poor stands in much of the fall-sown wheat at Arlington. This condition is not general in Virginia or in neighboring States, however. Leaf rust [Puccinia rubigo-vera tritici] infection was 100 percent at the late milk stage in commercial varieties, both at Arlington and in the farmers' fields examined. Stem rust [P. graminis] was present in all fields, and in the late-sown fields yield is certain to be reduced from the combined rust infection. Mildew [Erysiphe graminis] on wheat was the heaviest ever observed and Septoria is common. (J. W. Taylor, Arlington Experimental Farm, Rosslyn, June 18. Cereal Courier 30: 81. July 10).

HELMINTHOSPORIUM BLIGHT ON CORN IN VIRGINIA: R. G. Henderson sent in corn leaves infected with Helminthosporium turcicum with the remark "This is the second lot of corn leaves affected with helminthosporium blight that we have received from farmers this season. In this particular case the disease seems to be becoming rather severe."

DOTHICHLOË ON PANICUM IN NEBRASKA: R. W. Goss sent specimens of Panicum scribnerianum affected by Dothichloë nigricans (Speg.) Chardon, as determined by W. W. Diehl. This is apparently the first report from Nebraska.

POTATO ROT AND "BLIGHT" IN VARIOUS STATES: Telegraphic summaries in the Weekly Weather and Crop Bulletin for the dates indicated report rotting of potatoes in New Jersey "Daily excessive rains flooded fields... potatoes rotting locally" (July 26), Pennsylvania "Daily rains in central and east; excessive locally in southeast... Early potatoes rotting in ground." (July 26), Virginia "Near-normal temperatures; rainfall heavy... Some truck beginning to rot, particularly potatoes." (June 28), and Wisconsin "Warm; frequent, moderate, locally heavy showers... Potatoes good, though some rotting; early being dug." (July 12). "Blight" (? late blight) is reported in Pennsylvania "blight reported in late crop in some places." (July 12).

BACTERIAL SPOT OF TOMATO IN NEBRASKA: Bacterial spot of tomato, caused by Phytomonas vesicatorium is more common this year in eastern Nebraska than it has been for a number of years. (R. W. Goss, July 28, Nebraska Agricultural Experiment Station).

SOME DISEASES OF ORNAMENTAL TREES IN OREGON: Two mimeographed publications report diseases of conifers recently observed in Oregon. A disease reported as "Berckman blight", caused by a new and undescribed species of Coryneum, has become very serious in Oregon nurseries and home gardens during the past few years, on varieties of Thuja orientalis (Milbrath, J. A. Berckman blight. Oregon Agr. Exp. Sta. Circ. Information 186. May 1938). The other disease is a root and crown rot of Chamaecyparis caused by a species of Phytophthora. It has been found on C. lawsoniana varieties alumi and erecta, and on C. obtusa var. gracilis, but the host range has not been determined. It was observed during 1937 as a serious disease of Alumi cypress in commercial plantings. Preliminary surveys have shown that it occurs in a large majority of nurseries in northern Oregon. It is feared that the disease will eliminate Alumi cypress from Oregon nurseries unless its advance is stopped. (Milbrath, J. A., and F. P. McWhorter. Preliminary recommendations for the control of root and crown disease of cypress. Oregon Agr. Exp. Sta. Circ. Information 187. May 1938).

A CORRECTION: Dr. Freeman Weiss calls attention to the fact that in the note on iris leaf spot in North Carolina, by Luther Shaw and M. M. Evans (P.D.R. 22, no. 6, page 102) the variety designated as "D. Hairn" should be "D. Haring" instead.

QUESTIONS

Diseases of small grains. Judging from the absence of reports, anthracnose (Colletotrichum graminicolum) has not been much in evidence during the past few years. This year, however, reports have indicated increased prevalence in several States. It would be desirable to know whether or not this is true generally.

Stem rust and leaf rusts probably have been more fully discussed than any other diseases this year; nevertheless, there has been very little information on their occurrence--or that of other diseases of cereals--east of the Mississippi.

There are indications that scab has been troublesome in some regions. Reports concerning this disease would be appreciated.

Bacterial wilt of corn. The only States from which this disease has been reported so far this year are Virginia, New York, and Massachusetts. Has it been observed anywhere else?

Fruit Diseases. Among other questions the following may be asked: What is the present status of apple scab? Is fire blight more prevalent than usual? Has brown rot caused damage?

Vegetable Diseases. Recent weather in the northeast must have been favorable for the development of potato late blight. Is it more damaging than usual? What is the condition with regard to other potato diseases?

Other Crops and Other Diseases. There are too many other diseases concerning which there is a dearth of reports to specify them but anyone who has information of timely interest is asked to report it.

PRECIPITATION FOR THE FIRST HALF OF 1938

(From Weekly Weather and Crop Bulletin, July 26).

Since the last severe drought in 1936, there has been a decided trend to more abundant moisture in the United States. Last year, 1937, brought moderate to fairly heavy rains to most sections, while the present year has been unusually wet when the entire country is considered. The first half of 1938, up to June 1, had above-normal rainfall rather generally, except in the more eastern States and extreme Northwest (See Fig. 1). Recent unusually heavy rains in the East have largely made up the deficiencies there so that the year to date has had above-normal rainfall over almost the entire country. This is a very unusual moisture situation.

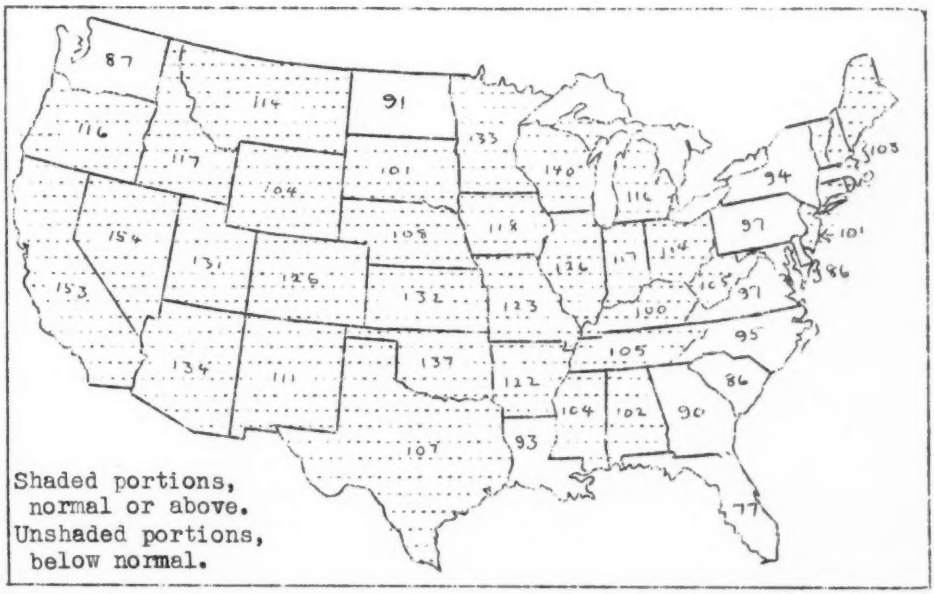

Fig. 1. Percentage of Normal Precipitation, by States, January-June, 1938.